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Effect of Quality and Packaging on the Price of Edible Sunflower Oil

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Abstract

The prices accepted by consumers in the market are influenced by the characteristics of the goods, based on consumer behavior. Each of these features contributes to the price agreed upon by both consumers and suppliers. The packaging of a product plays a crucial role in attracting consumers and protecting the product from damage. High-quality and visually appealing packaging can create a positive perception among consumers, potentially resulting in a higher price point. Additionally, specialized packaging techniques designed to preserve freshness and extend the shelf life of oil can also impact the price. This study investigates the impact of quality and packaging on the price of sunflower oil in Iran. The primary objective was accomplished using the hedonic pricing method. Given the qualitative and ordinal nature of the dependent variable, the ordinal logit model was employed. The sample size was determined through a two-stage cluster sampling approach, which involved collecting 350 questionnaires from consumers in Tehran city. Statistical analysis was conducted using Shazam and Stata software. Numerous factors influence the consumption of sunflower oil at various levels. However, in general, factors such as increasing age, higher income levels, the presence of diseases, and dietary considerations contribute to a decrease in its consumption. On the other hand, factors like improving product quality, enhancing the quality of oil packaging, increasing consumer loyalty towards edible oil, and rising online sales of this product contribute to an increase in its demand.

Keywords: Edible oil, Ordinal logit, Packaging, Quality, Sunflower

Introduction

Per capita oil consumption in Iran stands at 17 kg, whereas the global average is 12.5 kg. Studying the behavior of households in terms of consumption of oils and fats has an important place in predicting the health status of society. Oils and fats provide a significant part of the body's energy, essential fatty acids and fat-soluble vitamins (Kobriti *et al*., 2010).

The significance of oils and fats extends beyond health considerations and also holds substantial commercial importance. This importance has led to significant research investments over an extended period of time (Anis Ahangar, 2016). According to the report from the Vegetable Oil Trade Association in Iran, the country's edible oil requirements are partially met by domestic oil production units, while another portion is acquired through the importation of crude oil. Subsequently, this imported crude oil is refined and packaged within domestic factories before being distributed to the market. It's worth noting that during the transportation of imported crude oil from the port to the factory, there is typically a

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loss of approximately five percent in production. The amount of edible oil production in the country during the years 2015-2019 has grown from 1.5 million kilograms to more than 2 million kilograms on average increasing by 23%. Fraction of the country's need for vegetable oil is provided through imports. A large part of this import is devoted to sunflower oil. According to the report of the Iranian Vegetable Oil Association, sunflower oil is from Ukraine and Russia. The amount of imports has increased from 1 million kilos to 1.5 million kilos of cream. The country's vegetable oil import has grown by an average of 27% during the years 2015-2019. It should be noted that between one and 1.2 billion dollars of foreign currency is spent annually on the import of edible oil. This issue itself is a reason for paying more attention to the quality and packaging of sunflower oil for good marketing.

The rate of decline in oilseed production in Iran has been -85% over the years. The trend of importing oilseeds in Iran is based on the latest statistics published by the Customs of the Islamic Republic of Iran. The amount of import of oilseeds to the country increased by 315% on average during the years 2010-2016. The per capita consumption of oil in the country is about 22 kilograms on average. The trend of per capita consumption of vegetable oil during the years 2015-2016 has grown by an average of 17% per year. According to the statistics published by the Iranian Vegetable Oil Association, the production of oilseeds in Iran does not meet the domestic demand, and most of the demand for this product is met through imports, which is a reason for paying attention to the production of high-quality and marketable oil. Studying for discovering the needs of edible oil consumers and analyzing the process of their buying behavior in these products and prioritizing the influencing factors such as: (quality and packaging) in this process are one of the main duties of marketing managers. As a result, consumers in the target market who are different from each other in terms of economic and buying behavior such as age, income, taste, education level, etc. to identify, for offering appropriate products or services to that market. In this study the research questions are: From the consumer's point of view, regarding packaging, and quality, considering the qualitative and sequential nature of the dependent variable, how effective is it in the price of sunflower oil? Packaging sunflower oil refers to the process of filling and sealing sunflower oil into containers, such as bottles, cans, or pouches, for distribution and sale. It involves several steps to ensure the oil is safely and securely packaged. Packaging means the construction, installation, and preparation of a container that preserves the health of the container or its contents during the period after production and the stages of transportation, storage, distribution, and final consumption and prevents potential physical and chemical injuries and risks. Slow (Romo *et al*., 2018). Packaging is a container that keeps food, protects it, and differentiates the product, packaging also facilitates transportation, storage, and trade. Packaging plays an important role in attracting attention and influencing consumer purchase decisions. All packaging elements must be combined to attract the attention of the consumer when purchasing the product (Ares and Deliz., 2010). Packaging plays an important role in marketing and encouraging or sometimes even discouraging consumers from buying a product especially in the sales phase or when a consumer wants to choose one of the different brands of a product. Consumers' tendency towards better quality food products, fresher and with easier access has increased more than before. By using new and suitable packaging materials and methods, the packaging industry has played an important role in reducing food waste and producing healthier products. Food packaging has been developed to protect food from heat, light, moisture, oxygen, microorganisms, insects, and dust. In the last few decades, we have witnessed the increase of desirable capabilities such as prolonging the life of food by controlling microbial, enzymatic, and biochemical reactions in the packaging environment by implementing various strategies such as oxygen removal, controlled release of salts, carbon

dioxide oxide and so on (Karimi and Mousavi, 2018). Packaging factors that potentially influence consumer decision-making in product selection fall into two categories, including informational and visual elements (Silayvi and Space, 2004). Food packaging is one of the main ways to protect it during the production-to-consumption chain. Preserving food from any foreign contamination, creating an environment away from the atmosphere, light and foreign microorganisms, and increasing shelf life are considered to be general characteristics of existing packaging (Iran-Manesh, 2017). Packaging dimensions are an important tool to communicate with consumers; In such a way that each of those dimensions has different effects on consumer behavior and plays an important role in consumer attraction. Therefore, paying attention to the effects of packaging on consumer behavior can play a significant role in the success of the company (Sabir Nazaraga and Ebrahimi, 2016).

The most common type of household oil is sunflower liquid oil, and these oils are offered in different volumes. The most important factor for the design of oil packaging is the functional and organic criterion. It is important and ultimately the criterion of convenience and beauty of packaging is important for customers (Mohammadi, 2015). Most of the liquid oils that are used for cooking in the commercial area are in volumes from 650 grams to 17 kilograms, but for home kitchens used from 650 grams to 5 kilograms and are packaged in glass and plastic bottles. Glass bottles for sunflowers and most of the oils that are used for frying and cooking are sold in plastic bottles (Mohammadi, 2015). On average, consumers, use 2 liters of edible oil per month. The monthly cost of household food consumption on average is 19768 thousand rials and they spend on average 100 thousand rials to prepare their cooking oil. The lowest coefficient of variation is related to the variable of age and the highest coefficient of variation is related to the variable of monthly cost of edible oil. Since packaging is one of the important tools in national and international marketing, it has its key role. To strengthen their competitive power in domestic and foreign markets, economic enterprises have been paying attention to the issue of packaging for many years, and they use design, graphics, colors, and the use of appropriate packaging to increase their market share compared to competitors. Good packaging can act as a silent salesperson. The research of big oil companies in the field of marketing and ways to promote sales show that packaging has the greatest effect on attracting customers and selling methods in domestic and foreign markets. The packaging may indicate the condition or even the quality of the product.

From a marketing perspective quality, it can be said that some companies have adopted Total Quality Management (TQM) to design their products, services, and marketing processes. Product quality has a direct impact on customer satisfaction. In the most accurate sense, quality can be defined as "immunity from defects". But most customer-oriented companies define quality beyond this concept. They measure quality in terms of customer satisfaction. Quality is the intersection of customer expectations (Juran, 2003). Preserving the well-being of a society's population falls within the realm of ensuring the safety, health, and quality of food. Food quality encompasses a broad spectrum of requirements, encompassing safety, authenticity, nutritional and sensory attributes, as well as ethical considerations and market demands. (Carlucci *et al*, 2013). It is expected that concerning food industry products, quality is an influencing factor in the price paid by the customer, the amount of product consumption, and consumer loyalty. As in the studies conducted by (Hamidizadeh and Ghamkhavari, 2008; Rezaei Galshepel, 2012), this variable is included in the model. According to the information on Iran's food and agriculture industry website, there are 52 active edible oil production companies in the country. Based on the findings of this research, the 5 main brands of household sunflower edible oil along with their consumption share are shown in Table 1. Table 2 shows the number of sunflower edible oil-producing units in Iran.

Material and Methods

Hedonic pricing method

According to Rosen's formulation, the consumer's utility function based on the characteristics of a product can be written as equation (1-1) and as follows.

$$u = u(z, \emptyset(x)) \quad (1)$$

where Z is the observable characteristics and X is their effects and unobservable characteristics. The important assumption here is the pseudo-concaveness of utility and the linearity of the relationship between X and Z

$$Z = X_{n\times k}\beta_{k\times 1} \quad (2)$$

Table 1- The main brands of edible oil and the consumption share of each

Ladan	Oila	Bahar	Famila	Aftab	Other brands
33.36	93.19	79.14	68.8	9.1	32.18

Source: Arifpour, 1396

Table 2- Sunflower Edible oil production companies along with their brand names

Product brand	Company name	Product brand	Company name
Rana	Zarindasht Sofre	Gol Poune	Golbahar oil products
Xdane	Xdane	Etka	Khorramshahr oil company
Nina	Fariko (Iranian oil products)	Nina	Fars Bazargan
Famila– Oila	cultivation and industry of Golbarg Baharan	Khavardasht	Khavardasht
Samre	Samre food industry	Khorasan cotton and oilseeds	Khorasan cotton and oilseeds
Sobhan	Behpak Industrial Co	Naz Banoo	Khorasan process oil
Dalahu (Nazgol)	Mahidasht Kermanshah Agriculture and Industry Company	Mahak	Zartak Sablan
Product Brand	Company Name	Product Brand	Company Name
Aftab	Margarin	Nab	Nab
Verzhen	Agriculture and industry of Golestan abkar	Pamchal	Noush Azar
Varamin	Etka	Salej	Sea potion
Gol Poune	Processing of Golbahar vegetable oils	Jahan	The world's vegetable oil
Gol Naz	Gol Naz vegetable oil	Narges Shiraz	Shiraz vegetable oil
Salamat	Ardabil vegetable oil production cooperative	Naz	vegetable oil of Naze Isfahan
Ghonche	Northern agriculture and industry	Qezel ozen	Gilan Olive
Zarin	Zarin Company in Nama Sharq	Loye	Loye food industry
Niloufar	Arjan Noveen	Ladan	Behshahr Industrial
Balak	Balak Pharmaceutical and food laboratory	Damon	the product
Almo	Eastern Chirak	Saee	Agriculture and industry of Golestan, Dezful
Maryam	hidden flower	Orkide	Golbahar Sepahan
Zarpash	Fasahati food industry	kolale	Gold Ghazan
Bahar	Bahar oil	Manila	Kerman pistachio alchemists
Entakhab	Entakhab novin vegetable oil	Shad gol	Shadgol
Ghou	Pars vegetable oil	Dastaas	Golshan Orange Cooperative Co
Mahya	Caspian radiation	Meysam	agriculture and industry of Golestan Zayton Alborz
Kokab	Golden Olive Agricultural and Food Production Company	Vioni	Arian, the taste of the Caspian
Sadr	Var Aviz oiling	Produced by Golosh Khorasan grain food industry	Produced by Golosh Khorasan grain food industry

[1] Source: Iran food and agriculture industry website 2018

1- www.foodkeys.com

where X is an n×k matrix that is n<k in the general case. n is the number of goods and K is the number of characteristics. If P is a p×1 vector of the unit price of X. Each iM consumer faces the following budget constraints.

$$Px_i = m_i \quad (3)$$

By maximizing the utility function (1-3) provided according to the budget constraint for the consumer, the final situation is as follows:

$$\lambda^h P_j \geq \sum_{i=1}^{h} \frac{\partial u^h}{\partial z_i} \times \frac{\partial z_i}{\partial x_i} + \sum_{i=1}^{q} \frac{\partial u^h}{\partial \emptyset_i} \times \frac{\partial \emptyset_i}{\partial x_i} \quad (4)$$

where q represents the number of specific works of goods and λ^h is the Lagrange coefficient. By putting formula (2) in formula (4) the following relationship is obtained:

$$P_j \geq \sum_{i=1}^{h} [\frac{1}{\lambda^h} \cdot \frac{\partial u^h}{\partial z_i}] b_{ij} + \sum_{i=1}^{q} [\frac{1}{\lambda^h} \cdot \frac{\partial u^h}{\partial \emptyset_i}] \frac{\partial \emptyset_i}{\partial x_i} \quad (5)$$

The Lagrange coefficient is the marginal utility of money for the h-th consumer. Therefore

$$\left(\frac{1}{\lambda^h}\right)\left(\frac{\partial u^h}{\partial \emptyset_i}\right), (\frac{1}{\lambda^h})(\frac{\partial u^\lambda}{\partial z_i}) \quad (6)$$

Shadow prices are for special features and works and in equilibrium is as follows.

$$P_j = \sum_{i=1}^{n} P_{zi} b_{ij} + \sum_{i=1}^{q} P\emptyset_i \frac{\partial \emptyset_i}{\partial x_i} \qquad j1, \ldots., k \quad (7)$$

The equation (7) holds when consumers consume the goods or are about to consume them. As long as the above assumptions are the basis of the Lancaster formula there is a linear relationship between the characteristics and the price of goods. Also, the condition of not being able to repack is established, it is possible to choose different combinations of A to achieve experimental and practical goals between different goods, and the linear form is an acceptable form for the hedonic model. Another important issue in hedonic studies is choosing the appropriate functional form. Researchers in this field use criteria such as goodness of fit, coefficient of determination, and standard deviation of regression. According to the collected data and good model fit criteria, the functional form used in this research is as follows:

$$\ln P_i = b_0 + b_1 \ln x_1 + b_2 \ln x_2 + b_3 \ln x_3 + \cdots + b_n \ln x_n + \varepsilon \quad (8)$$

. In this model, P_i is the price of each liter of edible oil, x_n, x_2, x_1, the characteristics related to the quality and packaging of the edible oil, such as clear color, pleasant smell, high smoke point, pleasant taste, appropriate weight, maintaining the quality of the product. Having food information labels makes it easy to open the door, etc. is also an error.

Ordinal logit model

As mentioned above, models with answers to more than two items are divided into sequential and non-sequential. Therefore, in this study, due to the nature of the ordinal selection of the tendency to consume edible oil and loyalty to the edible oil brand, ordinal logit was used, which is one of the most complete models for estimation in such research and can divide and separate the dependent variable under study into There are different classes. In this way, the dependent variable is subjected to a series of assumptions and according to the different specified classes, it assigns values to itself. In this study, the effect of the explanatory variables of education, age, income, marital status, etc. on the consumption of edible oils under study is investigated and determined. The ordinal logit model is based on a continuous latent variable, which is in the form of relation (10-3) (Judge, 1988).

$$y_i^* = \beta' x_i + \varepsilon_i \qquad -\infty < y_i^* < +\infty \quad (9)$$

In this relation, y_i^* people's propensity to consume, β_I is the vector of parameters that must be estimated, $x_i$is the observed vector of the non-random explanatory variable that shows the characteristic of the ith person, ε_i except for the disturbance that is logistic distributed in the ordinal logit Is. Since y_i^* is a latent variable, standard regression techniques do not apply to sample size estimation. If $y_i$is considered as a discrete and observable variable that shows different levels of people's willingness to consume, the relationship between the hidden variable y_i^* and the observed variable y_i from the ordinal logit model is obtained as follows (Green, 2005).

$$y_i = \begin{cases} 0, & -\infty \le y_i^* < \mu_1 \\ 1, & \mu_1 \le y_i^* < \mu_2 \\ 2, & \mu_2 \le y_i^* < \mu_3 \\ . & \\ . & \\ . & \\ j, & \mu_{j-1} \le y_i^* < +\infty \end{cases} \quad i = 1, \dots, n \qquad (10)$$

In this part, n is the value of the sample size, μ_j are the thresholds that define the discretely observed responses, which are estimate by β, an these classes sho the same percentage of a tendency to consume edible oils. Give also, the values in the y classification are completely conventional. In this case, the respondents in the questionnaire are faced with a question that asks them to choose their desired y_i^* which depends on the measurable factors x and immeasurable ε, from among the given options. The above model is estimated using the maximum right-exponential method and the desired probabilities are obtained using the equation (10):

$$Pr(y_i = j) = Pr(y_i \ge \mu_{j-1}) = Pr(\varepsilon_i \ge \mu_{j-1} - \beta' x_i) = F(\beta' x_i - \mu_{j-1}) \quad (11)$$

In this relation, F is the cumulative distribution function (CDF) for ε and as can be imagined, its functional form can be determined as logit or probit. In expressing cumulative probability, the ordinal logit model estimates the probability of person i at level j or below (1,...,j-1). It should be noted that the response groups in the ordinal logit model are placed in order. The ordinal logit model is corrected in the form of the equation.

Results and Discussion

To determine the effective factors in the consumption of sunflower oil and to determine the effect of each of the variables, the generalized ordinal logit model was estimated. In this model, the effect of market variables and demographic characteristics of people as explanatory variables on the amount of sunflower oil consumption is measured as a dependent variable. The demographic characteristics of the consumer are gender, age, marital status, education level, number of family members, the effect of disease and diet on the sunflower oil, monthly income, and monthly oil consumption. Also, there are seven marketing variables such as; brand loyalty, price of sunflower oil, quality of sunflower, packaging, advertising, abundance in the market, and online purchase of oil. The correlation coefficients between explanatory variables (independent variable) were tested, and the results showed that there is no high correlation between any of the studied variables.

It should be noted that the classification of consumers in different consumption groups is based on their responses to the questionnaire question (How much sunflower oil do you consume?) and since the answer to this question is in the form of a Likert Scale, therefore consumers have also been made on the same basis based on the frequency of different groups of respondents in the consumption of sunflower oil. According to the results, 47 percent of consumers use sunflower oil in very small amounts, 25 percent of consumers use this oil in a medium amount, and 28 percent of consumers use this oil in large amounts.

Table 3- Frequency of three groups of sunflower oil consumption

Row	Group	Frequency (number)	Frequency (percentage)
1	very little	167	47
2	medium	86	25
3	Much	97	28

Source: Source: Research finding

Table 4- Shows the estimation results of the ordinal logit model

Variable	Coefficient	Significance level	Standard error
Gender	-.604	0.001	.184
Age	-.030	0.002	.009
Marital status	.238	0.279	.220
Education	.144	0.006	.052
the number of family members	-.100	0.130	.066
Effect of disease and diet	.193	0.011	.076
Income	-.107	0.002	.034
Quantity of consumption	.124	0.024	.054
Brand loyalty	.356	0.007	.131
The price of edible oil	.159	0.077	.090
Edible oil quality	.606	0.000	.145
Packaging	-.136	0.207	.108
Advertising	-.172	0.109	.107
Abundance in the market	.181	0.061	.096
Buy oil online	1.024	0.001	.303
The first threshold	2.048		.851
The second threshold	3.453		.862
R^2 = .104 Prob>chi2= 0.000 Loog Likelihood = -599.747			

Source: Research finding

In the estimation of the ordinal logit model, before the results of the model are examined, it is necessary to examine the regression test of parallel lines. The test of parallel regressions evaluates the reasonableness of the theorem of equality of parameters for all groups.

To put it differently, if the null hypothesis of this test, which posits that the coefficients are identical for all groups, is accepted, it suggests that the parameters of the situation are consistent across all response groups. Table 5 presents the outcomes of the parallel regression test. The results show that based on the value of Brent's statistic (80.13) and the significance level (0.00), the null hypothesis of the test, that is, the assumption of parallel regressions, has been violated. This shows that the estimated parameters are not the same for different groups. Therefore, the generalized ordinal logit model is a proper estimation.

Table 5- Parallel regression test results - sunflower oil Brent test

Statistics	The coefficient quantity	The significance level
Wolfe Gould	61.37	0.000
Brant	80.13	0.000
Score	77.68	0.000
likelihood ratio	80.37	0.000
Wald	83.27	0.000

Source: Source: Research finding

In estimating the generalized ordinal logit model, the third group (the group with high consumption of sunflower oil) is considered the base group. The estimation results of the generalized ordinal logit model are shown in Table 6. The value of the Chi-2 statistic shows that the whole regression is significant. The value of R2 is also 15 percent, which is suitable

for models such as ordinal logit. In general, coefficients are not interpreted in these models, only their sign is used in moving to a higher group of consumption. For example, the gender variable in the second group has a coefficient equal to -0.897, which is significant at the one percent level. This means that assuming other conditions are constant, the probability of men being in the heavy consumption group decreases. The age variable in the first group is equal to -0.058 and is significant at the level of one percent. This means that, with increasing the age of consumers, the probability of consumers being placed in the average consumption group decreases. This could be attributed to the fact that as consumers age, their concern for their health and the risk of developing various diseases, including cardiovascular conditions, tends to rise. Consequently, older consumers may opt to use less oil as a way to preserve their health. The coefficient of the marital Stata variable for the first group is equal to 0.839 and is significant at the five percent level. This means that if consumers get married, the probability of them being in the middle consumption group increases. The number of consumers in the family has a coefficient of 0.191, which is significant at the five percent level in groups one and two. Therefore, it can be said that if other conditions are constant, with increase in the number of consumer household members in the low consumption group, the probability of people being placed in the medium consumption group increases, and also in the medium consumption group, with the increase in the number of household members, if other conditions are constant, the probability of consumers being placed in the middle consumption group increases. The consumption group will increase a lot. This issue is caused by the increase in the amount of consumption due to the increase in the number of family members.

Table 6- The results of the estimation of the generalized ordinal logit probabilities model of sunflower oil

Variable	The coefficient quantity	The significance level	The coefficient quantity	The significance level
Gender	-0.293	0.230	-0.897	0.000
Age	0.058	0.000	-0.003	0.752
Marital status	0.839	0.002	-0.077	0.750
Education	-0.043	0.535	-0.043	0.535
The number of family Members	0.191	0.012	0.191	0.012
Effect of disease and diet	-0.526	0.002	-0.526	0.002
Income	-0.164	0.000	-0.050	0.174
Quantity of consumption	0.098	0.061	0.098	0.061
Brand loyalty	0.314	0.010	0.341	0.010
The price of edible oil	0.105	0.257	0.105	0.257
Edible oil quality	0.206	0.308	0.105	0.257
Packaging	0.077	527.	-0.292	0.008
Advertising	-0.217	048.	-0.217	0.048
Abundance in the market	0.049	0.658	0.315	0.002
Buy oil online	1.069	0.000	1.069	0.000
R^2 = .154 LR chi2=159.045 Prob>chi2= 0.000 Loog Likelihood = -566.547				

Source: Research finding

Due to the similarity of the interpretation of the coefficients and to avoid repetition as well as more use of the interpretation of the final effect in logit models, we ignore the interpretation of other variables and proceed to the interpretation of the final effect. For this purpose, the final effects were calculated for each of the household groups with different levels of sunflower oil consumption, and the results are presented in Table 7.

Table 7 shows the results of estimating the final effect of independent variables in all consumption groups. Based on the result, it can be said that with the stability of other conditions, at the average consumption level, the probability of men being placed at the higher consumption level increases by 0.171 units, while in the high consumption group, this probability decreases by 0.222 units.

With one-unit increase in the age of consumers, in a low consumption group, the probability of being in a higher consumption group increases by 0.012 units, while at an average consumption level, this probability decreases by 0.009 units, which can be due to paying more attention to diet and reducing oil consumption to maintain health and prevent disease in older age. With other variables being constant, at low and high consumption groups, the probability of married people being placed in the higher consumption group decreased by 0.147 and 0.019 units, respectively, while the probability of the married middle consumer's group being placed at higher levels was 0.166 unit increases. With the increase in the number of family members, the probability of low and medium-group consumers being in the higher consumption group decreased by 0.033 and 0.013 units, respectively, while in the high consumption group, the probability of people being in the higher consumption group was 0.047 units will increase.

In large families where monthly sunflower oil consumption is higher, there is a preference for using more oil, especially if it has a lower price compared to other edible oils. Additionally, the influence of health concerns and dietary considerations on the choice of oil increases the likelihood of low and medium-level consumers being categorized into higher consumption groups by 0.072 and 0.038 units, respectively. Conversely, the probability of high-level consumers being classified into the higher consumption group decreases by 0.120 units. An increase in people's income, assuming that other conditions are constant, increases the probability of low-level consumers in higher consumption levels by 092/0 units, while this probability for medium and high-level consumers is 0.044 units and 0.174, respectively unit decreases, which can be concluded that as people's income increases, their desire to use healthier vegetable oils increases. With an increase in the amount of sunflower edible oil consumption, the probability of people with low and medium levels being placed in higher levels decreases by 0.017 and 0.007 units respectively, while the probability of high-level consumers being placed in higher levels is 0.024 unit increases. It can be said that for consumers who use sunflower oil in large quantities, if their consumption increases, the probability that they will replace sunflower oil with other edible oils is very low, but this probability is low for the average consumption group and is much higher. As the level of loyalty to the sunflower edible oil brand increases, the probability of consumers in the low and medium consumption groups being placed in the higher groups is 0.060 and 0.024 units, respectively, and the probability of high-level consumers being placed in higher consumption levels is 0.084 unit increases. Therefore, it can be said that loyalty to the brand in the high consumption group will increase the level of consumption. This issue is caused by the recognition and trust of the consumer in the quality, price, and other characteristics of the product.

Table 7- Results of the final effect of the generalized ordinal logit model of sunflower oil

Variable	Consumption level 1		Consumption level 2		Consumption level 3	
	The coefficient quantity	The significance levels	The coefficient quantity	The significance levels	The coefficient quantity	The significance levels
Gender	.051	0.233	171.	0.000	222-.	0.000
Age	.012	0.000	009-.	0.000	003-.	0.752
Marital status	-.0147	0.002	166.	0.001	019-.	0.749
Education	.007	0.537	003.	0.530	010.	0.534
The number of family Members	-.033	0.013	013-.	0.019	047.	0.012
Effect of disease and diet	.092	0.001	038.	0.010	120-.	0.002
Income	.028	0.000	016-.	044.	072-.	0.174
Quantity of consumption	-.017	0.062	007-.	0.074	024.	0.061
Brand loyalty	-.060	0.010	024-.	0.022	084.	0.010
The price of edible oil	-.036	0.310	201.	0.000	237.	0.000
Edible oil quality	-.013	0.526	086.	0.000	072-.	0.008
Packaging	-.038	0.045	015.	0.072	054.	0.049
Advertising	-.008	0.657	069-.	0.000	078.	0.002
Abundance in the market	-.188	0.000	077-.	0.004	265.	0.000

Source: Research finding

According to Table 7, with the increase in the quality of sunflower edible oil, the possibility of people with medium and high consumption groups being placed in higher consumption groups increases by 0.201 and 0.237 units, respectively. This fact indicates the high importance of quality in consumer selection, loyalty, and increase in edible oil consumption. Therefore, it can be said that the production of a high-quality product by oil-producing companies will increase the level of consumption and loyalty to the consumer brand. An increase in packaging quality increases the probability of middle-level consumers being placed in higher levels by 0.086 units, while this probability decreases by 0.072 units for high-level consumersIn conclusion, focusing on packaging improvements and enhancing the design and quality of the product can serve as an effective marketing strategy to attract more consumers to the middle consumption group. However, it's important to note that an increase in the price of sunflower oil, driven by elevated packaging costs, may lead to reduced consumption among the high-consumption group. Consequently, consumers with moderate consumption levels tend to place greater emphasis on the quality of the packaging for their sunflower edible oil, in contrast to those with high consumption levels. Therefore, addressing this aspect and implementing changes and enhancements at a reasonable cost can result in a significant increase in sunflower oil sales volume. An increase in advertisements decreases the probability of low consumer level group consumers being placed in higher levels groups by 0.038 units, and increases the probability of middle and high-level consumers being placed in higher levels groups by 0.015 and 0.054 units, respectively.

As expected, advertisements have positive effects on sunflower oil consumption in medium and high consumer groups. In the medium consumption group, the increase in the variety of the product in the market find reduces the probability of the number of consumers in this group being placed in the higher levels group by 0.069 units, while for consumers who are in the high consumption level group, this

probability increases by 0.078 units. Therefore, the availability of the product in the market and the easier access of consumers to it will increase sales and also increase loyalty to it, which is in line with the results of Arifpour's study (2016). According to the results obtained in Table 7, it can be said that buying sunflower oil online reduces the probability of consumers from the low and medium consumption group being placed in the higher consumption group by 0.188 and 0.077 units, respectively, while this probability factor Placement of high consumption group people in higher consumption levels increases by 0.265 units. It can be concluded that consumers with a high level of oil consumption consider online shopping markets as an easy solution to purchase sunflower products, save time and travel costs, and also reduce costs by benefiting from the discounts offered by online markets.

According to the obtained results, sunflower oil has the highest consumption position compared to other edible oils for several reasons, such as having a lower price than other edible oils, the harmony of taste and smell with the taste of most consumers. Various factors affect the consumption of this sunflower oil at different consumption levels, but in general, factors such as increasing age, increasing level of income and increasing the level of the awareness effect of disease and diet on the type of sunflower cause a decrease in the consumption of this edible oil. Also, other factors such as increasing the level of product quality, increasing the level of quality of oil packaging, increasing the level of consumer loyalty to sunflower edible oil, and increasing the online shopping of this product, increase the demand for sunflower.

Conclusions and Suggestions

According to the obtained results, sunflower oil has the highest consumption position compared to other edible oils for several reasons, such as having a lower price than other edible oils, the harmony of taste and smell with the taste of most consumers, etc. As consumer age increase, their desire to use sunflower oil decreases. Being married causes a decrease in the consumption of this oil at low and high consumption levels group and an increase in consumption at the medium level group. The increase in the number of consumers in the family reduces the consumption of this oil at the low and medium consumption levels groups and increases the consumption at the high consumption level group. The increase in the effect of disease and diet awareness on the type of sunflower oil causes an increase in the consumption of sunflower oil in low and medium consumption levels groups and a decrease in its consumption in the high consumption levels group. An increase in consumer's income causes an increase in consumption at the low consumption level and a decrease in the amount of consumption at the medium and high consumption level. As the level of loyalty to the sunflower edible oil brand increases, there is a decrease in sunflower oil consumption within the low and medium-consumption groups. However, in the high-consumption group, there is an increase in sunflower oil consumption with higher brand loyalty. Increasing the quality of sunflower edible oil increases consumption in the medium and high consumption groups. Improving the packaging of sunflower edible oil leads to an increase in consumption in the medium consumption group and a decrease in consumption in the high consumption level. An increase in advertising causes an increase in consumption at the medium and high consumption levels groups and a decrease in consumption at the low consumption level group. An increase in variety in the market causes a decrease in consumption at the medium level and an increase in consumption at the high consumption level. Buying oil from online marketing will reduce consumption at low and medium consumption levels and increase consumption at high consumption levels.

In general, according to the obtained results, producing high-quality products and presenting them in various packages, conducting extensive advertisements, and increasing product variety supply in the market, especially online markets, can help to increase product sales and attract

loyal customers. Nowadays, with the expansion of the culture of online shopping and the attractiveness of these markets for various reasons such as discounts, free shipping, and the possibility of comparing the quality and price of products in real-time, these markets are very attractive for consumers. Therefore, it can be said that one of the most practical ways to increase market share is to offer products in online markets.

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بررسی اثر کیفیت و بسته‌بندی بر قیمت روغن خوراکی افتابگردان

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چکیده

بر اساس رفتار مصرف‌کنندگان قیمت‌هایی که در بازار مورد پذیرش مصرف‌کننده قرار می‌گیرند ناشی از ویژگی‌های کالاهاست .این ویژگی‌ها هرکدام سهمی در قیمت مورد توافق مصرف‌کننده یا تقاضاکننده و عرضه‌کننده دارد. لذا شناخت دقیق خواسته‌های مصرف‌کننده موجب تولید و عرضه کالای تقاضامحور، کاهش هزینه‌های بازاریابی، نفوذ بیشتر محصول در بین مصرف‌کنندگان و افزایش مطلوبیت مصرف‌کننده و وفاداری او به برند خواهد شد. این مطالعه به بررسی اثر کیفیت و بسته‌بندی بر قیمت روغن خوراکی (آفتابگردان) در شهر تهران به‌عنوان بزرگ‌ترین بازار مصرف روغن خوراکی پرداخته‌است. به‌منظور دست‌یابی به هدف اصلی از روش قیمت‌گذاری هدونیک استفاده شده‌است. سپس به‌منظور تعیین عوامل مؤثر بر مقدار مصرف این روغن‌ها و همچنین تعیین عوامل مؤثر بر وفاداری مصرف‌کننده به برند روغن خوراکی، با توجه به ماهیت کیفی و ترتیبی متغیر وابسته از الگوی لاجیت ترتیبی استفاده شده‌است. تعیین حجم نمونه به روش نمونه‌گیری خوشه‌ای دومرحله‌ای در دسترس از بین کل مصرف‌کنندگان شهر تهران بوده و اطلاعات از جمع‌آوری ۳۵۰ پرسشنامه که توسط مصرف‌کنندگان تکمیل گردیده، به‌دست‌آمده است. الگوهای موردمطالعه به ترتیب با استفاده از نرم‌افزارهای shazam و stata برآورد شد. عوامل مختلفی بر میزان مصرف این روغن در سطوح مختلف مصرف تأثیرگذار می‌باشد .اما به‌طورکلی عواملی مانند افزایش سن، افزایش سطح درآمد و افزایش سطح تأثیر بیماری و رژیم غذایی بر نوع روغن خوراکی موجب کاهش در میزان مصرف این روغن خوراکی می‌شود. همچنین عوامل دیگری مانند افزایش سطح کیفیت محصول، افزایش در سطح کیفیت بسته‌بندی روغن، افزایش سطح وفاداری مصرف‌کننده به روغن خوراکی و افزایش فروش آنلاین این محصول، افزایش سطح تقاضا برای این خوراکی را به همراه دارد.

واژه‌های کلیدی: روغن خوراکی، قیمت‌گذاری هدونیک، لاجیت ترتیبی، وفاداری به برند

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